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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/749,648 | 12/30/2003 | Sung Mun Jung | 20063/10019 | 9406 |

34431 7590 07/15/2005

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| EXAMINER |
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CHACKO DAVIS, DABORAH

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| ART UNIT | PAPER NUMBER |
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1756

DATE MAILED: 07/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/749,648

Applicant(s)

JUNG ET AL.

Examiner

Daborah Chacko-Davis

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-6 is/are allowed.
- 6) ☒ Claim(s) 1-2, and 7-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 03/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2, and 7-9, are rejected under 35 U.S.C. 102(e) as being anticipated by U. S. Patent No. 6,596,608 (Saito).

Saito, in col 8, lines 1-30, and lines 57-64, in col 9, lines 1-28, and in col 10, lines 16-19, discloses a memory device comprising a memory cell region (on a substrate) including a gate, a source diffusion region, a drain diffusion region, a device isolation region; and a peripheral region adjacent the memory cell region, that includes a peripheral circuit region, a device isolation region, wherein the trench formed in the peripheral region is deeper than the trenches formed in the memory cell region (claim 1). Saito, in col 13, lines 8-10, and lines 50-51, discloses that the trenches in the cell region possess a depth of about 200nm (claim 2). Saito, in col 8, lines 1-30, and lines 57-64, in col 9, lines 1-28, in col 11, lines 18-67, in col 12, lines 1-43, , in col 15, lines 32-35, discloses a method of forming a memory device comprising forming i) a memory cell region, ii) a peripheral region that includes a peripheral circuit region on a silicon substrate, iii) implanting As ions into the memory cell region to form diffusion regions

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(inherently possesses the claimed implantation energy), iv) forming a pad oxide (silicon oxide) film on the substrate, v) forming a silicon nitride (pad nitride) on the pad oxide, forming a resist pattern on the pad nitride film (reference 7 of figure 5A), vi) etching part of the pad nitride film, pad oxide film and the substrate using the photoresist pattern as the mask (see figures 6A, 6D, and 7A), wherein etching the silicon nitride using an etchant with high selectivity of the pad nitride to the pad oxide, etching the silicon oxide selectively (not etching the silicon substrate), and etching the silicon substrate in the peripheral region selectively (not etching the oxide in the cell region) (claims 1-2, and 7-9).

Allowable Subject Matter

3. Claims 3-6, are allowable over the prior art of record (U. S. Patent No. 6,596,608 (Saito) because the prior art of record does not disclose performing an etching process using the etched pad nitride layer as a mask so that a relatively shallow trench area is formed in the cell region, and a relatively deep trench in formed in the peripheral region.


Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd


June 25, 2004.


JOHN A. MCPHERSON
PRIMARY EXAMINER